

- a. Turn the thimble until the spindle contacts the anvil. If the micrometer has a ratchet stop, use it to ensure that the proper amount of pressure is applied.
 - b. The adjustment is correct if the 0 mark on the thimble aligns exactly with the 0 mark on the sleeve line. If the marks do not align, the micrometer is out of adjustment.
 - c. Follow the manufacturer's instructions to adjust the micrometer.
- 2B. To check a micrometer larger than 1 in. or 25 mm, use the standard gauge supplied by the manufacturer. A standard gauge is a steel block, disc or rod that is machined to an exact size.
- a. Place the standard gauge between the spindle and anvil, and measure its outside diameter or length. If the micrometer has a ratchet stop, use it to ensure that the proper amount of pressure is applied.
 - b. The adjustment is correct if the 0 mark on the thimble aligns exactly with the 0 mark on the sleeve line. If the marks do not align, the micrometer is out of adjustment.

- c. Follow the manufacturer's instructions to adjust the micrometer.

Micrometer Care

Micrometers are precision instruments. They must be used and maintained with great care. Note the following:

1. Store micrometers in protective cases or separate padded drawers in a toolbox.
2. Make sure the spindle and anvil faces do not contact each other or another object while in storage. If they do, temperature changes and corrosion may damage the contact faces.
3. Do not clean a micrometer with compressed air. Dirt forced into the tool will cause wear.
4. Lubricate micrometers with WD-40 to prevent corrosion.

Telescoping and Small Bore Gauges

Use telescoping gauges (**Figure 33**) and small bore gauges (**Figure 34**) to measure bores. Neither gauge has a scale for direct readings. An outside micrometer must be used to determine the reading.

To use a telescoping gauge, select the correct size gauge for the bore. Compress the movable post and carefully insert the gauge into the bore. Carefully move the gauge in the bore to make sure it is centered. Tighten the knurled end of the gauge to hold the movable post in position. Remove the gauge, and measure the length of the posts with a micrometer. Telescoping gauges are typically used to measure cylinder bores.

To use a small-bore gauge, select the correct size gauge for the bore. Carefully insert the gauge into the bore. Tighten the knurled end of the gauge to carefully expand the gauge fingers to the limit within the bore. Do not overtighten the gauge, as there is no built-in release. Excessive tightening can damage the bore surface and damage the tool. Remove the gauge and measure the outside dimension (**Figure 35**). Small bore gauges are typically used to measure valve guides.

Dial Indicator

A dial indicator (A, **Figure 36**) is a gauge with a dial face and needle used to measure variations in dimensions and movements. Measuring brake rotor runout is a typical use for a dial indicator.

Dial indicators are available in various ranges and graduations. They use three basic types of mounting bases: magnetic, clamp, or screw-in stud. When purchasing a dial indicator, select the magnetic stand type (B, **Figure 36**) with a continuous dial face (**Figure 37**).

Cylinder Bore Gauge

A cylinder bore gauge is similar to a dial indicator. The gauge set shown in **Figure 38** consists of a dial indicator, handle, and different length adapters (anvils) to fit the gauge to various bore sizes. The bore gauge is used to measure bore size, taper and out-of-round. When using a bore gauge, follow the manufacturer's instructions.

Compression Gauge

A compression gauge (**Figure 39**) measures combustion chamber (cylinder) pressure, usually in psi or kg/cm². The gauge adapter is either inserted or screwed into the spark plug hole to obtain the reading. Disable the engine so it will not start and hold the throttle in the wide-open position when performing a compression test. An engine that does not have adequate compression cannot be properly tuned. See Chapter Three.

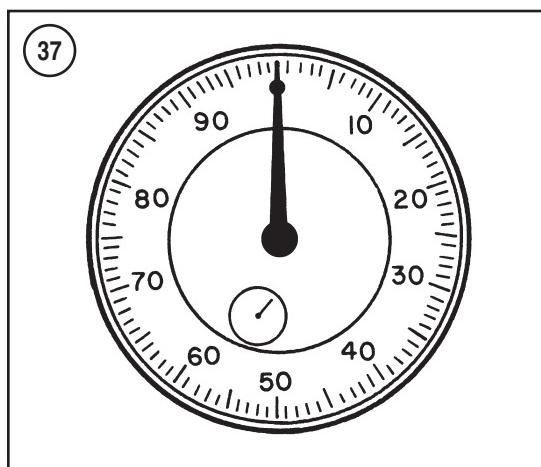
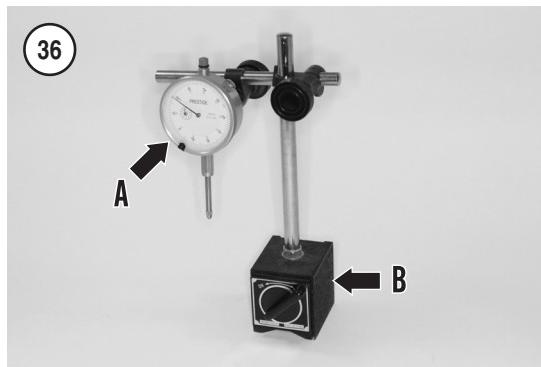
Spark Tester

A quick way to check the ignition system is to connect a spark tester to the end of the spark plug wire and operate the engine's kickstarter. A visible spark should jump the gap on the tester. A variety of spark testers are available from aftermarket manufacturers. Use of this tool is described in Chapter Two.

Multimeter

A multimeter (**Figure 40**) is an essential tool for electrical system diagnosis. The voltage function indicates the voltage applied or available to various electrical components. The ohmmeter function tests circuits for continuity and measures the resistance of a circuit.

Some test specifications for electrical components are based on results using a specific test meter. Results may vary if a meter not recommended by the



manufacturer is used. Such requirements are noted when applicable.

Ohmmeter (analog) calibration

Each time an analog ohmmeter is used or if the scale is changed, the ohmmeter must be calibrated. Digital ohmmeters do not require calibration.

1. Make sure the meter battery is in good condition.
2. Make sure the meter probes are in good condition.
3. Touch the two probes together and watch the needle. It must align with the 0 mark on the scale.
4. If necessary, rotate the set-adjust knob until the needle points directly to the 0 mark.

ELECTRICAL SYSTEM FUNDAMENTALS

A thorough study of the many types of electrical systems used in today's ATVs is beyond the scope

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